



eloFlex 471EFR...

eloFlex 471 EFR... is a configurable safety relay with 4 independent safety inputs (2-channel) and up to 4 safety outputs as well as 4 control outputs.

The internal logic link is configured specifically for each customer.

Product characteristics

- Up to 4 safety functions can be implemented in one device
- The number of safety outputs (relays) can be set according to the individual requirement, making this a cost-effective solution.
- Increased functionality using less space in the switch cabinet.
- The units are tamper-proof as are pre-configured during ordering.
- Cost-effective and reliable by unique identification of configuration for maintenance, commissioning and service
- Can be perfectly adapted to your application through various configuration options, offering maximum flexibility
- Additional sensors can be connected via elobau interfaces for input expansion

The following logic and safety functions are available:

| Logic link: | Safety functions: |
|-------------|--------------------|
| AND | t_{ON} / t_{OFF} |
| OR | Safetyfunction |
| XOR | 2-hand |
| NAND | Safetygate |
| NOR | E-stop |
| XNOR | N.O./N.O. |
| NOT | or N.O./N.C. |

Technical drawing

IMAGE 1/4



IMAGE 2/4

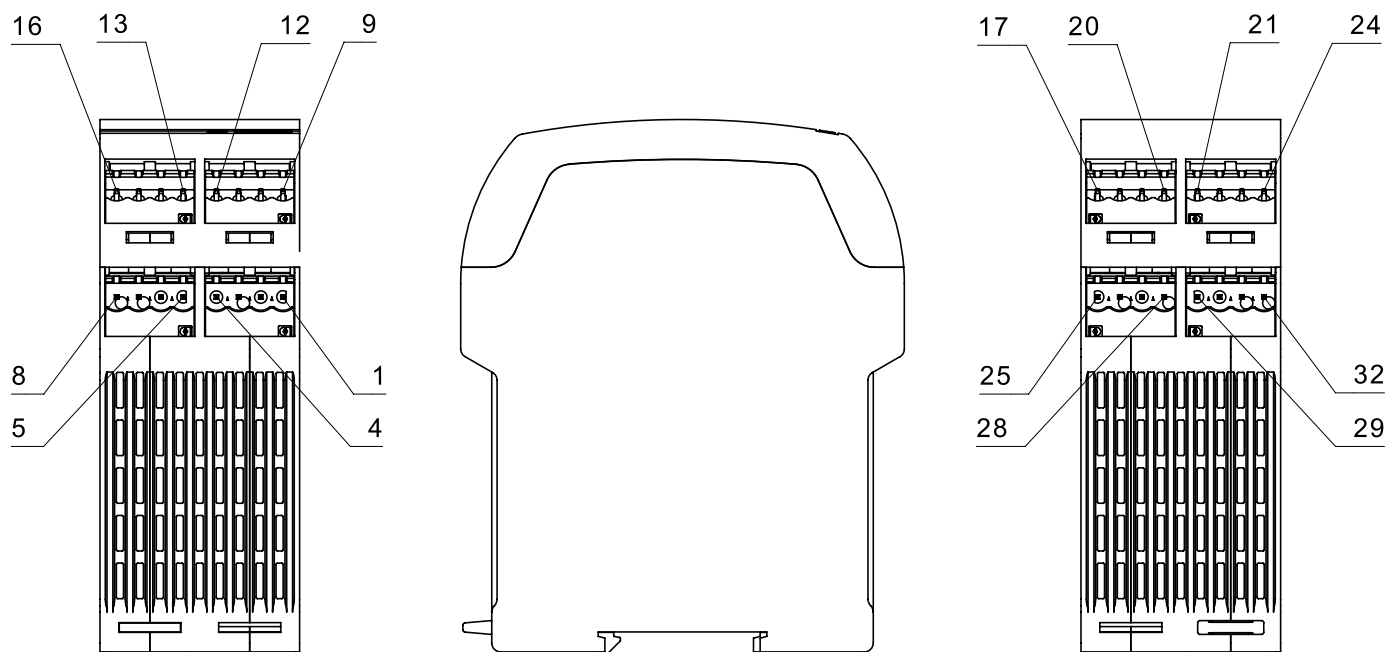


IMAGE 3/4

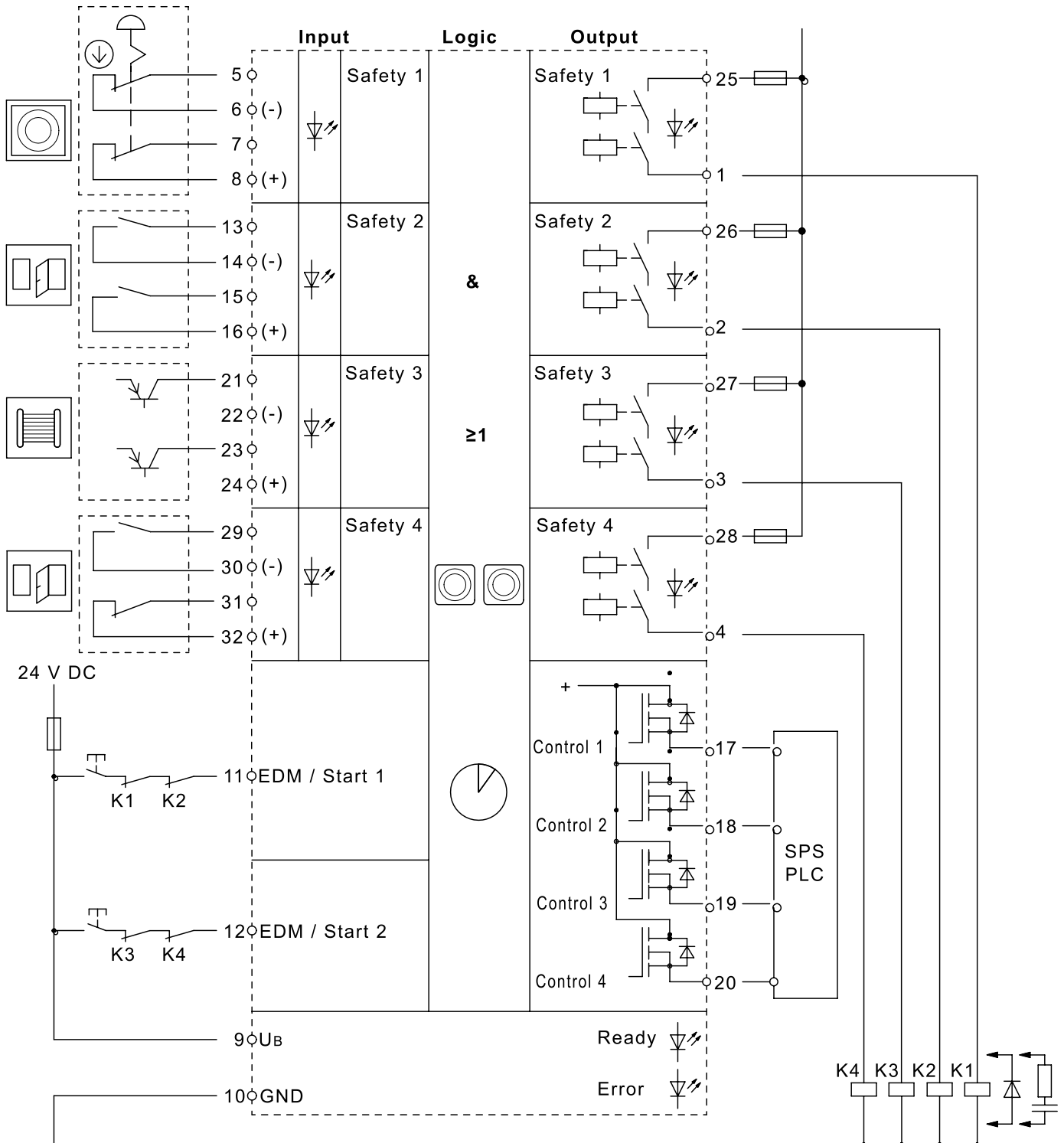


IMAGE 4/4

471EFR Verdrahtungsbeispiel PL e



Product options

IMAGE 1/1

1. Define safety function and contact form of inputs

| Sicherheitseingang 1 |
|--|
| <input type="checkbox"/> |
| Sicherheitseingang 2 |
| <input type="checkbox"/> |
| <input type="checkbox"/> |
| Sicherheitseingang 3 |
| <input type="checkbox"/> |
| <input type="checkbox"/> |
| Sicherheitseingang 4 |
| <input type="checkbox"/> Schließer/Schließer |
| <input type="checkbox"/> Schließer/Öffner |
| <input type="checkbox"/> Öffner/Öffner |
| <input type="checkbox"/> OSSD |

- Max. 4 different safety functions are possible
- Already defined: performance level d or e

For example

Guard door = N.O./N.O. or N.O./N.C.

Emergency stop = N.C./N.C.

Light barrier with PNP output = OSSD

2. Define and allocate logic safety inputs (1-4) for safety outputs (1-4)

| Sicherheitsausgang 4 | | | |
|--|-------------------------------|---|---|
| Sicherheitsausgang 3 | | | |
| Sicherheitsausgang 2 | | | |
| Sicherheitsausgang 1 | | | |
| Eingang | Logik | Ein-/Abschaltverzögerung in s | Externe Überwachung |
| <input type="checkbox"/> Sicherheitseingang 1 | <input type="checkbox"/> AND | <input type="checkbox"/> t_{ON} <input type="checkbox"/> S | <input type="checkbox"/> Schütz / Start 1 |
| <input type="checkbox"/> Sicherheitseingang 2 | <input type="checkbox"/> OR | | <input type="checkbox"/> Schütz / Start 2 |
| <input type="checkbox"/> Sicherheitseingang 3 | <input type="checkbox"/> NAND | <input type="checkbox"/> t_{OFF} <input type="checkbox"/> S | |
| <input type="checkbox"/> Sicherheitseingang 4 | <input type="checkbox"/> NOR | | |
| | <input type="checkbox"/> XOR | | |
| | <input type="checkbox"/> XNOR | | |
| | <input type="checkbox"/> NOT | | |
| <input type="checkbox"/> 2-Handsteuerung 1 + 2 | | | |
| <input type="checkbox"/> 2-Handsteuerung 3 + 4 | | | |

AND
OR
NAND
NOR
XOR
XNOR
NOT

2-hand control

Definition of switch-on and switch-off delay 0...99.9s – resolution 0.1s

Note: Only one logic possible per control and safety output

3. Logic of control outputs (1-4)

| Kontrollausgang 4 | | | |
|---|-------------------------------|---|--|
| Kontrollausgang 3 | | | |
| Kontrollausgang 2 | | | |
| Kontrollausgang 1 | | | |
| Eingang | Logik | Ein-/Abschaltverzögerung in s | |
| <input type="checkbox"/> Sicherheitseingang 1 | <input type="checkbox"/> AND | <input type="checkbox"/> t_{ON} <input type="checkbox"/> S | |
| <input type="checkbox"/> Sicherheitseingang 2 | <input type="checkbox"/> OR | | |
| <input type="checkbox"/> Sicherheitseingang 3 | <input type="checkbox"/> NAND | <input type="checkbox"/> t_{OFF} <input type="checkbox"/> S | |
| <input type="checkbox"/> Sicherheitseingang 4 | <input type="checkbox"/> NOR | | |
| | <input type="checkbox"/> XOR | | |
| | <input type="checkbox"/> XNOR | | |
| | <input type="checkbox"/> NOT | | |
| <input type="checkbox"/> BTR | | | |
| <input type="checkbox"/> FEHLER | | | |
| <input type="checkbox"/> wie Sicherheitsausgang 1 | | | |
| <input type="checkbox"/> wie Sicherheitsausgang 2 | | | |
| <input type="checkbox"/> wie Sicherheitsausgang 3 | | | |
| <input type="checkbox"/> wie Sicherheitsausgang 4 | | | |

AND
OR
NAND
NOR
XOR
XNOR
NOT

Control output like safety output 1-4

Further functions

BTR

Error

Definition of switch-on and switch-off delay 0...99.9s – resolution 0.1s

Note: Only one logic possible per control and safety output

4. Safety outputs 1-4

| Schütz extern 1 |
|--------------------------------------|
| <input type="checkbox"/> |
| Schütz extern 2 |
| <input type="checkbox"/> Automatisch |
| <input type="checkbox"/> Manuell |
| <input type="checkbox"/> Überwacht |

Assignment of external contactors to safety outputs

Manual

Automatic

Monitored

For definition of switch-on and switch-off delay, see step 2 and 3

Article characteristics

| Attribute | 471EFR2D14K... | 471EFR3E11K... | 471EFR3E12K... | 471EFR3E13K... | 471EFR3E14K... | 471EFR3E11K_ ▶ |
|---|--------------------------------|----------------|----------------|----------------|----------------|----------------|
| Max. switching voltage at safety output | 30 V DC | | | | | |
| Max. switching voltage at control output | 26.4 V DC | | | | | |
| Max. switching voltage at safety output | 250 V AC | | | | | |
| Max. switching current at safety output | 3 A | | | | | |
| Max. switching current at control output | 0.1 A | | | | | |
| Max. switching power at control output | 2.64 W | | | | | |
| Max. switching power at safety output | 750 VA | | | | | |
| Number of configurable relay safety outputs | 4 | 1 | 2 | 3 | 4 | 1 |
| Number of electronic control outputs | 4 | | | | | |
| Number of redundant safety inputs | 4 | | | | | |
| Stop category 0 (STO) nach IEC 61800-5-2 | yes | | | | | |
| Stop category 1 (SS1) nach IEC 61800-5-2 | yes | | | | | |
| EDM/start input | yes | | | | | |
| Start function | Depending on the configuration | | | | | |
| Utilization category | AC-15 / DC-13 | | | | | |
| Operating voltage min. | 21.6 V DC | | | | | |
| Operating voltage max. | 26.4 V DC | | | | | |
| Current consumption | 800 mA | | | | | |
| Power consumption | 21.12 W | | | | | |
| Cross-short detection | yes | | | | | |
| LED display | two-coloured | | | | | |
| Operating time | 3000 ms | | | | | |
| Fuse operating voltage | 1A fast | | | | | |
| Overvoltage category | III | | | | | |
| Fuse safety output | 3A slow blow | | | | | |

Article characteristics

| Attribute | 471EFR2D14K... | 471EFR3E11K... | 471EFR3E12K... | 471EFR3E13K... | 471EFR3E14K... | 471EFR3E11K_ ▶ |
|--|--------------------------------|---------------------------|----------------|----------------|----------------|----------------|
| Min. switching voltage at control output | 21.6 V DC | | | | | |
| Max. switching power at safety output | 90 W | | | | | |
| Max no operating cycles at 0.5A switching current (ohmic load) | 1000000 | 3000000 | | | | |
| Max no operating cycles at 3A switching current (ohmic load) | 190000 | 280000 | | | | |
| Contact form | Abhängig von der Konfiguration | | | | | |
| PL acc. to EN ISO 13849-1 | d | e | | | | |
| SIL acc. to IEC 61508 | 2 | 3 | | | | |
| SIL CL acc. to IEC 62061 | 2 | 3 | | | | |
| PFHD according to IEC 61508 | 1,26x10 ⁻⁸ 1/h | 3,28x10 ⁻⁹ 1/h | | | | |
| Operating life | 20 Tm | | | | | |
| Category acc. to EN ISO 13849-1 | 3 | 4 | | | | |
| Hardware fault tolerance (HFT) according to IEC 61508 | 1 | | | | | |
| Max. switching frequency safety output with load | 360 1/h | | | | | |
| Max. switching frequency safety output with load | 72000 1/h | 18000 1/h | | | | |
| Dimensions | 130 x 45 x 120 mm (H/B/T) | | | | | |
| Housing material | PA, PC | | | | | |
| Housing colour | schwarz | | | | | |
| Protection class | IP30 IEC60529 | | | | | |
| Operating temperature min. | -15 °C | | | | | |
| Max. operating temperature | 55 °C | | | | | |
| Min. storage temperature | -40 °C | -25 °C | | | | |
| Max. storage temperature | 70 °C | | | | | |
| Relative humidity | 5 - 85 % | | | | | |
| Protection class, installation space | IP54 DIN EN 60529 | | | | | |
| Shock resistance (Norm) | 30 g / 11 ms | | | | | |

Article characteristics

| Attribute | 471EFR2D14K... | 471EFR3E11K... | 471EFR3E12K... | 471EFR3E13K... | 471EFR3E14K... | 471EFR3E11K_ ▶ |
|------------------------------------|--|----------------|----------------|----------------|----------------|----------------|
| Continuous shock resistance (Norm) | 10 g / 16 ms | | | | | |
| Vibration resistance (Norm) | 10 ... 55 Hz | | | | | |
| Air pressure | 860 - 1060 hPa | | | | | |
| Delta tmax | 0.5 °C/min | | | | | |
| Mounting type | Mounting rail | | | | | |
| Weight | 400 g | | | | | |
| Torque for connection terminals | 0.5 N m | | | | | |
| Spring-type terminals | yes | | | | | |
| Screw terminals | Optional | | | | | |
| Double terminals | Optional | | | | | |
| Pluggable connection terminals | yes | | | | | |
| Min. connection cross section | 0.2 mm² | | | | | |
| Max. connection cross section | 2.5 mm² | | | | | |
| Certified in accordance with | EN ISO 13849-1 IEC 61508 IEC 62061 UL 508 / CSA 22.2 | | | | | |
| CE label | yes | | | | | |

Article characteristics

| Attribute | 471EFR3E12K_ | 471EFR3E13K_ | 471EFR3E14K_ |
|---|--------------------------------|--------------|--------------|
| Max. switching voltage at safety output | 30 V DC | | |
| Max. switching voltage at control output | 26.4 V DC | | |
| Max. switching voltage at safety output | 250 V AC | | |
| Max. switching current at safety output | 3 A | | |
| Max. switching current at control output | 0.1 A | | |
| Max. switching power at control output | 2.64 W | | |
| Max. switching power at safety output | 750 VA | | |
| Number of configurable relay safety outputs | 2 | 3 | 4 |
| Number of electronic control outputs | 4 | | |
| Number of redundant safety inputs | 4 | | |
| Stop category 0 (STO) nach IEC 61800-5-2 | yes | | |
| Stop category 1 (SS1) nach IEC 61800-5-2 | yes | | |
| EDM/start input | yes | | |
| Start function | Depending on the configuration | | |
| Utilization category | AC-15 / DC-13 | | |
| Operating voltage min. | 21.6 V DC | | |
| Operating voltage max. | 26.4 V DC | | |
| Current consumption | 800 mA | | |
| Power consumption | 21.12 W | | |
| Cross-short detection | yes | | |
| LED display | two-coloured | | |
| Operating time | 3000 ms | | |
| Fuse operating voltage | 1A fast | | |
| Overvoltage category | III | | |
| Fuse safety output | 3A slow blow | | |
| Min. switching voltage at control output | 21.6 V DC | | |

Article characteristics

| Attribute | 471EFR3E12K_ | 471EFR3E13K_ | 471EFR3E14K_ |
|--|--------------------------------|--------------|--------------|
| Max. switching power at safety output | 90 W | | |
| Max no operating cycles at 0.5A switching current (ohmic load) | 3000000 | | |
| Max no operating cycles at 3A switching current (ohmic load) | 280000 | | |
| Contact form | Abhängig von der Konfiguration | | |
| PL acc. to EN ISO 13849-1 | e | | |
| SIL acc. to IEC 61508 | 3 | | |
| SIL CL acc. to IEC 62061 | 3 | | |
| PFHD according to IEC 61508 | 3,28x10 ⁻⁹ 1/h | | |
| Operating life | 20 Tm | | |
| Category acc. to EN ISO 13849-1 | 4 | | |
| Hardware fault tolerance (HFT) according to IEC 61508 | 1 | | |
| Max. switching frequency safety output with load | 360 1/h | | |
| Max. switching frequency safety output with load | 18000 1/h | | |
| Dimensions | 130 x 45 x 120 mm (H/B/T) | | |
| Housing material | PA, PC | | |
| Housing colour | schwarz | | |
| Protection class | IP30 IEC60529 | | |
| Operating temperature min. | -15 °C | | |
| Max. operating temperature | 55 °C | | |
| Min. storage temperature | -25 °C | | |
| Max. storage temperature | 70 °C | | |
| Relative humidity | 5 - 85 % | | |
| Protection class, installation space | IP54 DIN EN 60529 | | |
| Shock resistance (Norm) | 30 g / 11 ms | | |
| Continuous shock resistance (Norm) | 10 g / 16 ms | | |
| Vibration resistance (Norm) | 10 ... 55 Hz | | |
| Air pressure | 860 - 1060 hPa | | |

Article characteristics

| Attribute | 471EFR3E12K_ | 471EFR3E13K_ | 471EFR3E14K_ |
|---------------------------------|--|--------------|--------------|
| Delta t _{max} | 0.5 °C/min | | |
| Mounting type | Mounting rail | | |
| Weight | 400 g | | |
| Torque for connection terminals | 0.5 N m | | |
| Spring-type terminals | yes | | |
| Screw terminals | Optional | | |
| Double terminals | Optional | | |
| Pluggable connection terminals | yes | | |
| Min. connection cross section | 0.2 mm ² | | |
| Max. connection cross section | 2.5 mm ² | | |
| Certified in accordance with | EN ISO 13849-1 IEC 61508 IEC 62061 UL 508 / CSA 22.2 | | |
| CE label | yes | | |